MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

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Maryland Roadside Tree Care Expert Exam Study Guide

For Exam Domain:

Chapter 7: Tree Selection, Installation and Establishment

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The most important part of tree selection is matching the tree with the site. We want to plant the right tree in the right place for the right reason. For example, if site is underneath overhead utility lines, plant a small scale tree with decurrent branching pattern.

Some site conditions to consider include:

- **Climate –** hardiness zone (the ability of a plant to tolerate the coldest temperatures experienced in a particular area), moisture availability, light, winds;
- **Soil** - soil test, texture, pH, nutrients, compaction
- **Space** - growing space – above and below, nearby signs, buildings, and overhead and underground utilities;
- **Other plantings –** turf, other shrubs and trees nearby;
- **Maintenance needs –** irrigation, watering

Tree considerations to think about include:

- **Size** - size, height and width at maturity;
- **Growth rate** - fast or slow growing;
- **Fruit, litter –** fruit – to use or a potential problem , fall color, flowers, bark, wildlife food, litter, thorns;
- **Water needs –** enough water available for that species;
- **Light needs –** is tree shade tolerant or intolerant;
- **Pest problems -** insect and disease problems with that tree or in the area;
- **Hardiness -** able to survive low or coldest temps in the area.

Also consider what the purpose of the planting is. For instance:

- **aesthetics**
- **engineering**
- **architectural**
- **screening**
- **shade**
- **beauty**

Try to select a tree that meets all three factors of site conditions, tree requirements, and purpose of planting. Other considerations include the functional uses of the tree, the tree's ability to adapt to the new site, and the amount of care the tree will need after planting.

All plant material should conform to American Standards for Nursery Stock ANSI Z60.1 – 2004. ANSI Z60.1-2004 required general specifications that all nursery grown planting material should meet. This standard provides buyers and sellers of nursery stock with common terminology to facilitate transactions involving nursery stock. They establish common techniques for measuring plants, specifying and stating the size of plants, determining the proper relationship between height and caliper, or height and width, and determining whether a root ball or container is large enough for a particular plant.

Trees are generally available from nurseries in one of three forms: bare root, balled and burlapped, and containerized.

When planting a BARE ROOT tree, dig the hole two to five times larger than the diameter of the stem at the root collar. The side should be slanted and the depth the same or a little less than the root ball. The hole should then be domed in the middle and the tree set on the dome with the roots spread out around the dome. This will allow the roots to grow into the surrounding loose soil. Do not expose bare roots to air as they will dry out.

Planting a tree with a TAP ROOT requires digging a hole deep enough to extend the root down straight beneath the stem. Do not bend the tap root. The hole should not be deeper than the extended tap root because the root collar will be covered by soil.

If planting a tree in a paved area, the planting site should have a minimum of 100 cubic feet of space.

Before accepting planting stock, the soil level at the top of the root ball or container should be examined in order to determine if the root collar is at the proper level.

To plant balled and burlapped (B&B) stock, remove the sod from the planting site and loosen the soil. Dig a hole at least as wide and as deep, or slightly less than as deep, as the rootball. Slope the sides of the hole and make sure there are no glazed sides. Handle the trees carefully, lifting them by the root ball and not by the stem. If drainage is problem, the root ball can be planted 1/3 the height of root ball above the grade. To eliminate settling, the bottom of hole should remain undisturbed to give solid support to root ball.

Cut the burlap and twine. Remove burlap from top and sides of root ball. You may leave burlap on the bottom of ball. This will allow the roots to grow out the top of the root ball. Fold burlap down below the ground level to avoid wicking. Remove the twine around the root ball. The same is true of wire baskets. Wire baskets are used for larger B&B trees. Cut away as much of wire as possible, unless the root ball is too loose to move it into the hole without breaking.

For containerized material, remove the container before planting, unless it is biodegradable. A containerized tree may be root bound. Therefore, separate and cut the roots, especially any girdling/circling roots. This will encourage roots to grow out into soil. Girdling

roots are common in trees which were started in containers. Girdling, kinked and circling roots could reduce the growth of a tree or even kill it.

Backfill the hole with the same soil, unless it is very poor soil. In most cases, amending the soil with organic material will not be of any particular benefit. Make sure there are no air pockets and the trunk is vertical. Firm up the soil, then water. The general rule of thumb is to water a tree if it has not received one inch of rainfall in a week.

Under normal conditions, root growth is best encouraged by planting even with the surrounding terrain. In wet conditions where drainage is a problem, raising about 1/3 of the root ball above ground will aid the spread of lateral roots. In arid conditions, a basin can be used to collect water. Make a berm to collect water, turn grass upside down. Avoid concentrating water at root ball to encourage root growth. Remove all tags, labels, and tree guards.

Mulching around a tree will aid in moisture retention, moderate soil temperature, reduce competition from weeds and grass, and help keep string trimmers away from the trunk. The mulch layer should not exceed 2 to 4 inches in depth. It is recommended that it be 3 feet to 6 feet diameter around the tree, although it can be as large as you wish. Mulch should not be placed against the trunk as the moisture and heat may cause the root collar to rot.

Prune only dead or broken branches after planting. Prune according to ANSI standards. Do NOT prune the crown to balance it with remaining root stock. If an evergreen, do not prune because the tree has no latent buds.

Staking is not always necessary unless the tree has a limited root system. Staked trees often have a smaller caliper, less trunk taper, and are more subject to tipping after the stakes are removed. Also stake if the site is windy, has sandy soil, it is a tall tree or has a large canopy, or there is a lot of pedestrian or equipment traffic around it. If a single stake is used, place it on the upwind side. Trees greater than 4 inches in diameter often require guying. Trees are guyed with three or four wires anchored to the ground.

When using metal stakes, wooden stakes or eye screws with turn buckles as devices for staking and guying, check several times a year for maintenance to make sure that the tree is not being girdled and that the system is still intact.

Remove wires and tags to prevent girdling. Tree staking and wraps should not be left on for more than one year. If trunk wrap and staking materials are left on indefinitely, trunk girdling and constriction may occur.

When digging a tree for transport, a rule of thumb for the width of the rootball is a minimum of 10 inches rootball diameter for every inch trunk diameter. Make clean cuts, wrap with burlap if greater than 18" unless loose soil, drum lace large root ball. Balled and burlaped trees with large soil balls should be drumlaced with rope for additional support. Trees with large tap root systems harder to transplant than fibrous root systems.

Root pruning helps before transplanting. Pruning should be done with sharp tools to make clean cuts. When a tree is harvested for transplanting, as little as 5% of the root system is likely to remain.

Times of year to transplant can be species specific. Check first. In general though, the best time for deciduous trees is after leaf drop or abscission in the fall and before leaf out in the spring. If deciduous trees must be moved in leaf, the use of antitranspirants may be warranted to reduce the possibility that plants will reach the permanent wilting point before, during, or after transplanting. Evergreens can be transplanted earlier in the fall and later in the spring than deciduous plants.

Anticipate the height and spread of tree at maturity when choosing the site to transplant. Check the proximity of the tree's location to hardscape features and utilities. Consider the "shade tolerance" of the tree compared to the length of sunlight (photoperiod) on site.

Large trees can be transplanted by a mechanical device known as a **tree spade**. When using a tree spade, no attempt should be made to move trees that exceed the size limitations of the machine being used. If installing trees over 8 inches in diameter, support the tree from four guy wires of ¼", 7-strand cable, 3/8" lag hooks, turnbuckles and deadmen.

The rate of recovery and re-establishment after planting and transplanting varies with species. The general rule of thumb for re-establishment in temperate climates is one year for each inch of caliper.